

B7
about 10 to about 300 milliWatt/cm² is generated at a distance of about one-half to about two inches from said concave surface.

B8
43. An assembly comprising:
a light base; and,
one or more light-generating devices positioned on said light base, each of which is arranged to generate a lobe of light, said lobes combining such that light output of substantially uniform intensity of about 10 to about 300 milliWatt/cm² is generated on a surface at a distance of about one-half to about two inches from said light-generating devices.

REMARKS

Claims 1 and 6-51 are pending. Claims 49-51 are allowed. Claims 1 and 6-48 are rejected. Claims 1, 38 and 43 have been amended herein.

Rejections Under 35 U.S.C. § 112, First Paragraph

The Examiner rejected claims 1 and 6-48 under 35 U.S.C. § 112, first paragraph, asserting that they contain new matter in that the claimed range of distance of one-half to about 3 inches was not in the disclosure as originally filed.

Applicants respectfully disagree with the Examiner, and submit that the claimed range of distance of one-half to about 3 inches is reasonably within the disclosure as filed. However, in order to expedite allowance of the application, Applicants have amended claims 1, 38 and 43 to read "a distance of about one-half to about two inches from said light-generating devices." Support for the amendment may be found, for example, on page 20 lines 8 and 9 of the application as filed. Applicants submit that the amendment moots the Examiner's rejections under 35 U.S.C. § 112, first paragraph. Accordingly, Applicants request reconsideration and withdrawal of the new matter rejections.

Additionally, to make the rejected independent claims more consistent with allowed independent claim 49, Applicants have amended the rejected claims to change "plurality" to "one ore more," as used in claim 49.

Rejections Under 35 USC § 103(a)

The Examiner asserted that "[t]he prior art rejections are based solely on not giving the new matter patentable weight." (Office Action of 06 May 2002, page 5). Applicants herein have amended claims 1, 38 and 43 to remove the asserted new matter. Accordingly, Applicants request that the art rejections be reconsidered and withdrawn, and submit that the application is in condition for allowance. Nevertheless, Applicants herein address the Examiner's art rejections.

The Examiner rejected claims 1, 6-19, 24-26, 29, 32-34, 38, 40, and 42-46 as unpatentable over Jensen et al. (WO 99/37236), asserting that Jensen et al. discloses a light base with a curved surface and a plurality of light-generating devices that emit visible light, wherein the light will inherently overlap and form a combined field of relatively uniform intensity, that the specific intensity range is an obvious matter of choice, and that the type of light generating device is an obvious matter of choice.

The Examiner rejected claims 20-23 as unpatentable over Jensen et al. in view of Kipke et al. (US 5,487,662), asserting that while Jensen et al. does not disclose LEDs, Kipke discloses use of LEDs, concluding that it would be obvious to modify Jensen et al. and Kipke et al. "in order to place the source in the desired location."

The Examiner rejected claims 27, 28, 39, 41, 47 and 48 as unpatentable over Jensen et al. in view of Kipke et al. and further in view of Kennedy (US 5,634,711), asserting that although Jensen et al. and Kipke et al. do not disclose a fan or blue light, Kennedy discloses a fan and blue light and it would be obvious to modify Jensen et al. and Kipke et al. with the fan and light of Kennedy.

The Examiner rejected claims 30 and 31 as unpatentable over Jensen et al. in view of Rhoades (US 3,636,633), asserting that although Jensen et al. does not disclose positioning means, Rhoades discloses positioning means in the form of a bite block and that it would be obvious to combine Jensen et al. and Rhoades to position the device in the desired location.

The Examiner rejected claim 35 as upatentable over Jensen et al. in view of Nikodem (US 5,813,854), asserting that although Jensen et al. does not disclose a flexible base, Nikodem discloses a flexible base and that it would be obvious to combine Jensen et al. and Nikodem "in order to position change the shape as desired."

The Examiner rejected claims 36 and 37 as unpatentable over Jensen et al. in view of Cipolla (US 5,879,159), asserting that although Jensen et al. does not disclose a device with filters, Cipolla discloses a filter and that it would be obvious to combine Jensen et al. and Cipolla to include the use of a filter.

Applicants respectfully disagree with the Examiner with respect to each and every art rejection. To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the reference itself or in the knowledge generally available to one of ordinary skill in the art, to modify the reference. Second, there must be a reasonable expectation of success. Finally, the prior art references must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not be based on Applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Applicants submit that the Examiner has failed to set forth a prima facie case of obviousness based on Jensen et al., Kipke et al., Rhoades, Nikodem, or Cipolla, alone or in any combination with one another. Applicants submit that the Examiner has not indicated which passage(s), in any of the cited references, states the motivation to modify any of the cited references with any other cited reference. Applicants submit that the Examiner has failed to establish that these references, alone or in any combination with one another, teach

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Filing Date: August 18, 2000
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or suggest all the claim limitations. Further, Applicants submit that the Examiner has not established that any of the cited references, alone or in any combination with one another, discloses an assembly comprising a light base and one or more light-generating devices positioned on said light base, each of which is arranged to generate a lobe of light, said lobes combining such that light output of substantially uniform intensity of about 10 to about 300 milliWatt/cm² is generated on a surface at a distance of about one-half to about two inches from said light-generating devices. Accordingly, Applicants request reconsideration and withdrawal of the rejections based on the cited references.

Applicants submit that, in light of the claim amendments and arguments above, independent claims 1, 37 and 43, and dependent claims 2-37, 39-42 and 43-48 are patentable over the cited references. Accordingly, Applicants request reconsideration and withdrawal of the rejections based on the cited references.

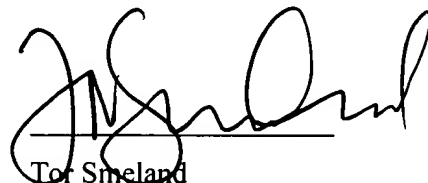
Conclusion

In light of Applicants' amendments and remarks, Applicants respectfully submit that this application is in condition for allowance. If there are any questions relating to the present application, the Examiner is respectfully invited to contact Applicants' attorney at the telephone number below. No fee, other than the fee for the three-month extension of time, is believed to be necessary. If any additional fee is required, or overpayment has been made, please charge, or credit, our Deposit Account No. 11-0171 for such sum.

Respectfully submitted,

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Cipolla et al. Examiner: Wilson, J.
Filing Date: 18 August 2000 Group Art Unit: 3732
Serial No: 09/641,646 Docket: 13072
For: Apparatus for Simultaneous Illumination of Teeth

Kalow & Springut LLP
488 Madison Avenue
New York, New York 10022

06 November 2002

Commissioner for Patents
Washington, D.C. 20231

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MARKUP OF AMENDMENTS

Please amend the above-identified application as follows:

IN THE SPECIFICATION:

Please amend the specification to include the following:

Please delete the paragraph spanning lines 21 to 22 on page 9 of the application and replace it with the following paragraph:

FIG. 8 shows a surface on which light-generating devices are positioned that is curved in three [dimensions'] dimensions.

Certificate of Mailing Under 37 C.F.R. 1.10

I hereby declare that this correspondence is being deposited with the U.S. Postal Service via Express Mail Label No. EV 035747306 US in an envelope addressed to: Commissioner for Patents, Washington D.C. 20231.

NOV 6, 2002
06 November 2002

Evan McHale
Evan McHale

Please delete the paragraph spanning from line 19 on page 18 to line 4 on page 20 of the application and replace it with the following paragraph:

Although Figures 1 and 2 illustrate embodiments having 3 outputs and 6 outputs, respectively, it is contemplated that the device may have any number of outputs or emitters, from one to a high multiple of outputs. Each output consisting of an individual fiber or fiber bundle that ultimately is connected to a light source. The embodiments of a device for the simultaneous and uniform illumination of at least eight central teeth in both the upper and lower arches were described in U.S. Application Serial No. [09/233,793.] 09/233,793, which is herein incorporated by reference. A preferred embodiment of this device has three linear optical outputs precisely positioned on three front (patient facing) surfaces. A more preferred embodiment of this device has two three bar devices stacked on the other resulting in six optical outputs on the front patient facing surfaces. Other embodiments of this invention include any number of outputs or emitters, from one to a high multiple of outputs. Each output can [comprises] comprise an individual fiber or fiber bundle that ultimately is connected to a light source. Embodiments having 3 or 6 outputs are presently preferred for the device because they achieve fairly uniform illumination of the eight or more central teeth without excessive manufacturing problems or costs. More than six [output] outputs, of course are feasible and may in fact be beneficial in terms of uniformity of illumination.

Please delete the paragraph spanning from page 30 line 17 to page 31 line 5 of the application and replace it with the following paragraph:

Returning to the question of the necessary number of rows of light-generating devices on surface 15, with today's technology it is unlikely that a single row of devices would suffice (from the standpoint of the light intensity that can be generated from an LED) and, because of that, the FIG. 6 mouthpiece is shown with a plurality of light-generating devices arranged in columns. FIG. 13 shows an arrangement where a column of light-generating devices has only two devices: 56 and 57. With a reasonably simple lens design the row of light-generating devices that contains device 56 can handle the upper teeth of a patient (e.g., tooth 71 attached to upper gum 72), and the row of light-generating devices that contains device 57 can handle

the lower teeth of a patient (e.g., tooth 73 attached to lower gum 74). If one row of devices (per tooth) is not sufficient because of light power output limitations of the devices used, or because a single device cannot provide the desired uniformity of light intensity on the teeth, a plurality of light-generating devices that is greater than two devices per column might be used, and appropriately focused. One might note that the light profile of the light-generating devices of FIG. 12 is broader and more flattened (i.e., more equal intensity) in the neighborhood of an axis that is perpendicular to surface 15 than [then] the light profile of the light-generating devices of FIG. 13. This intends to demonstrate the flexibility that a design of the lenses that are placed in front of the light source (whether integral to the light-generating device, and/or positioned in front of the light-generating devices) can impart.

Please delete the paragraph spanning from line 5 to line 15 on page 32 of the application and replace it with the following paragraph:

FIG. 18 shows a portion of the back view of element 10, with a column of printed-circuit type feed-through holes 24 for the anodes of the LEDs in a column, and an adjacent column of printed-circuit type feed-through holes 25 for the cathode of the LEDs in a column. Holes 24 are connected to bus 26, and holes 25 are connected to bus 27. Buses 26 and 27 are connected to electrical terminals (not shown) through which power is supplied to buses 26 and 27. When the LEDs are inserted into holes 24 and 25 and soldered to the feed-through holes, the construction is complete. It may be noted that LEDs are current devices, in the sense that the light output is a function of the LED current. To impart accurate control over the currents of the individual LEDs, a series current circuit [(as simple as a resistor)] (as simple as a resistor) is advantageously included with each LED, allowing the energy applied to buses 26 and 27 to be a controlled voltage. The current circuit, which is a well-known electrical element is not shown in FIG. 18 for sake of simplicity.

Please delete the paragraph spanning from line 9 to line 14 on page 34 of the application and replace it with the following paragraph:

The above discloses the principles of this invention by way of [an] illustrative

embodiments. It should be understood that various modifications and additions might be introduced by persons skilled in the art without departing from the spirit and scope of this invention, which is delineated by the appended claims. For example, an additional control variable over the light-generating devices is the size of the devices used (e.g., LEDs with [larger, or smaller] larger, or smaller, active areas). Also, different LEDs in the assembly can be selected to have different spectral ranges.

IN THE CLAIMS:

Please amend the claims to include the following:

1. (Twice Amended) An assembly comprising:
a light base having a concave curved surface forming an archway interior space; and
[a plurality of] one or more light-generating devices positioned on said light base to shine light into said archway space, each of which is arranged to output light in a lobe that overlaps light lobes of other devices, to form a combined field of light from said plurality of light-generating devices, such that the combined field of light results in light output of substantially uniform intensity of about 10 to about 300 milliWatt/cm² in said archway space at a distance of about one-half to about [3] two inches from said concave curved surface.
38. (Twice Amended) An assembly for placing in front of a patient's teeth when used in connection with whitening teeth comprising:
a light base having a generally concave curved surface; and,
[a plurality of] one or more light-generating devices positioned on said surface, each of which is arranged to output light in a lobe such that light output of substantially uniform intensity of about 10 to about 300 milliWatt/cm² is generated at a distance of about one-half to about [three] two inches from said concave surface.
43. (Twice Amended) An assembly comprising:
a light base; and,
[a plurality of] one or more light-generating devices positioned on said light base, each of which is arranged to generate a lobe of light, said lobes combining such that light

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output of substantially uniform intensity of about 10 to about 300 milliWatt/cm² is generated on a surface at a distance of about one-half to about [three] two inches from said light-generating devices.

Respectfully submitted,

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